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DISCLOSURE TEXT:

Disclosed is a RAID system that reduces the number of replaceable units to one. All essential elements except disks are combined into a single replaceable RAID system. For redundant systems, two units are required.

In typical RAID systems today, there are multiple Field Replaceable Units (FRUs). These include functions such as power supplies, fans or blowers, RAID controllers, interface modules, environment modules etc. This disclosure combines all of those functions into a single FRU. A diagram below shows one possible collection of functions that could be combined into such a FRU.

Most FRUs for storage subsystems are chosen based on function and likelihood of failure.

This partitioning has been stagnant over the past decade even though the failure rates of several components have decreased by one or two orders of magnitude; power supplies being the most notable where MTBF for a typical unit has gone from 15,000 hours to almost a million hours. Lower power and voltages on logic ICs have also decreased significantly causing significant improvements in

reliability. The number of connections requiring solder and PWB connections have more impact on reliability than other aspects of the electronics. Additional advantages of such a design is the reduced number of FRUs stocked for spares and reduced diagnostics and training needed to diagnose the defective FRU. The cost of the design is also reduced by eliminating blind plug connectors and circuits designed for hot-swap of FRUs.

The number of sku's produced, stocked and sold is also reduced for some savings.

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